

Iowa, at 1 p. m., moving E. 20° S. Four persons were injured. A railroad elevator, school house, seven residences, and several barns were totally destroyed, and twenty houses unroofed. The damage is estimated at \$50,000.

7th.—A tornado occurred at Junction City, Boyle county Kentucky, at 3 p. m., moving in a northeasterly direction. The cloud was funnel shaped. The path was 2,400 feet wide. No persons were killed. Some houses and out-buildings were destroyed.

12th.—A tornado occurred six miles south of Sargent, Custer county, Nebraska. Three persons and two horses were killed by lightning. Several houses were destroyed.

12th.—A tornado occurred at Wessington Springs, Jerauld county, Dakota. A small funnel-shaped cloud formed a little north of west of the town at 5.25 p. m., and moved in a south-westerly direction; no damage was done.

12th.—A number of small tornadoes occurred at various places in the state of Iowa:

At Bridgewater, Cass county, two persons were fatally, and several slightly, injured. Five dwellings, a broom factory, and a drug store were destroyed, and a large number of houses damaged; losses estimated at \$60,000.

In the southeastern part of Davis county three persons were killed and four injured, and two houses destroyed.

In Lakeport township, Woodbury county, about \$1,000 worth of timber was destroyed.

At Sloan, Woodbury county, the tornado occurred at 7.30 p. m.; fifteen persons were injured; three dwellings and some out-buildings destroyed.

Near Sully, Jasper county, the cloud appeared at 3 p. m., was funnel shaped and moved eastward; four persons were injured, two horses killed, one dwelling, one stable, and two barns destroyed.

A funnel-shaped cloud was observed nine miles northwest of Sioux City, Woodbury county, at 6.48 p. m.; twenty persons were injured. A passenger train was struck by the cloud, and three coaches and baggage car thrown from the track and badly damaged.

19th.—A tornado occurred at Cleveland, Kingman county, Kansas, at 1 a. m., moving southeast. The cloud was funnel shaped. One person badly, and several slightly, injured. Nine dwellings and two stables entirely destroyed and much damage to other property.

20th.—A tornado occurred at Seward, Stafford county, Kansas, in the afternoon, moving southeast. The cloud was funnel shaped. The path was 3,960 feet in width and twelve miles in length. Two horses and several head of cattle were killed. Eight persons were injured. Eight dwellings, two stables, and some out-buildings destroyed.

20th.—A tornado occurred at Sibley, Jackson county, Missouri, at 10 p. m., moving northeast. It is reported to have whirled contrary to the hands of a watch. The path was 1,200 feet wide. A large store was destroyed.

20th.—A tornado occurred near Leavenworth, Kansas, at night. Five persons were injured in one house; three horses killed and nine injured; one barn was blown to pieces; one dwelling was destroyed and the occupants thrown about in all directions; the second story was blown from another dwelling.

21st.—A tornado occurred at Ravenna, Portage county, Ohio, at 7.45 p. m., passing N. 25° E. The cloud was funnel shaped, whirled contrary to the hands of a watch, and was about one minute in passing a place. The path was five hundred feet wide and four miles long; two persons were injured. Four barns and one dwelling destroyed, and fifteen business blocks unroofed. Damage amounted to \$50,000.

21st.—A tornado occurred at Glasgow, Howard county, Missouri, at fifteen minutes past midnight. The cloud was funnel shaped; five buildings were destroyed and twelve unroofed; one man was killed and another seriously injured.

22d.—A tornado occurred at Friendship, Allegheny county, New York at 2.20 a. m., moving northeast. The cloud was funnel shaped and whirled contrary to the hands of a watch.

The path was five hundred feet wide; some buildings were unroofed and barns blown down.

27th.—A tornado occurred seven miles north of Nebraska City, Nebraska, at 1.40 p. m., moving northeast. The cloud was "serpent" shaped.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest stages for June, 1885, with dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, June, 1885.

[Expressed in feet and tenths.]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red river:</i>						
Shreveport, Louisiana.....	29 9	1, 2	22 2	25	16 5	5 7
<i>Arkansas river:</i>						
Fort Smith, Arkansas.....	15 0	26, 28	17 1	10	7 3	9 8
Little Rock, Arkansas.....	23 0	29	17 5	13	9 0	8 5
<i>Missouri river:</i>						
Yankton, Dakota.....	24 0	15	20 5	6	12 9	7 6
Omaha, Nebraska.....	18 0	17	16 6	3	9 4	7 2
Leavenworth, Kansas.....	20 0	19	17 9	1, 4	12 3	5 6
<i>Mississippi river:</i>						
Saint Paul, Minnesota.....	14 5	18, 19	7 4	12	4 4	3 0
La Crosse, Wisconsin.....	24 0	26, 27, 28	9 1	12, 14	6 4	2 7
Dubuque, Iowa.....	16 0	1	10 2	19	6 9	3 3
Davenport, Iowa.....	15 0	1, 2, 3, 6, 7	7 8	23, 24, 25	5 4	2 4
Keokuk, Iowa.....	14 0	13	12 3	30	7 0	5 3
Saint Louis, Missouri.....	32 0	17	27 0	4	18 8	8 2
Cairo, Illinois.....	40 0	22	30 8	15	25 5	5 3
Memphis, Tennessee.....	34 0	23 to 27	23 4	1	14 8	8 6
Vicksburg, Mississippi.....	41 0	31	33 1	5	27 2	5 9
New Orleans, Louisiana*.....	-3 0	1	-4 2	25, 26	-5 3	1 1
<i>Ohio river:</i>						
Pittsburg, Pennsylvania.....	22 0	6	9 9	30	1 6	8 3
Cincinnati, Ohio.....	50 0	2	22 5	24	9 3	13 2
Louisville, Kentucky.....	25 0	2 to 5	9 2	25, 26	5 5	3 7
<i>Cumberland river:</i>						
Nashville, Tennessee.....	40 0	3	27.8	29	3 3	24 5
<i>Tennessee river:</i>						
Chattanooga, Tennessee.....	33 0	1	18 6	27	3 4	15 2
<i>Monongahela river:</i>						
Pittsburg, Pennsylvania.....	29 0	6	9 9	30	1 6	8 3
<i>Savannah river:</i>						
Augusta, Georgia.....	32 0	11	14 8	24	6 4	8 4
<i>Mobile river:</i>						
Mobile, Alabama.....		5	18 5	22	15 4	3 1
<i>Sacramento river:</i>						
Red Bluff, California.....		10 to 19	1 0	1 to 5	0 8	0 2
Sacramento, California.....		1, 2, 3	11 0	29, 30	9 0	2 0
<i>Willamette river:</i>						
Portland, Oregon.....		23, 24	14 5	1	11 7	2 8
<i>Colorado river:</i>						
Yuma, Arizona.....		13	24 8	24	21 5	3 3

* Below high-water mark of 1874 and 1883. † Record for last 25 days of the month.

HIGH TIDES.

New London, Connecticut, 7th: the tide rose to a height of two feet above the normal high tide, and flooded cellars.

Eastport, Maine, 15th.

Smithville, North Carolina, 14th.

FLOODS.

Petersburg, Virginia: on the 2d reports from the surrounding counties stated that in consequence of the recent heavy rains all streams were much swollen, and that a number of small bridges were washed away. The river at Petersburg reached the highest point known for a long time, and the recently-built city reservoir overflowed.

Pittsburg, Pennsylvania: between 8 and 10 p. m. on the 4th a remarkably heavy rainfall occurred in the northeastern part of Allegheny City, and at Wood's Run. At the latter place the rainfall is estimated at not less than ten inches. This very heavy fall of rain caused a rise of seven feet in the Allegheny river at Wood's Run in about fifteen minutes, and resulted in flooding the cellars of many buildings; in some instances the floors of the first stories were covered. A number of calves, sheep and hogs were drowned.

Cleveland, Ohio: the heavy rain on the 4th caused numerous washouts in this city. The Cleveland and Pittsburg railroad track near Woodlawn avenue was washed out for a distance of one hundred and fifty feet.

New River Inlet, North Carolina: the crops in this vicinity were badly damaged by the heavy rainfall on the 9th.

The following is an extract from the "New York Herald," of June 11th:

CITY OF MEXICO, via GALVESTON, June 10, 1885.—Details of the terrible loss of life and destruction of property by the remarkable water-spouts near Lagos, in the state of Jalisco, and at Guanajuato, are still very meagre. All the dispatches thus far received estimate the loss of life in the Lagos district at over two hundred souls. The damage by the flood in the city of Guanajuato is now placed at \$300,000.

The "New York Journal of Commerce," of June 15th, contained the following:

CITY OF MEXICO, via GALVESTON, June 13.—Advices from Leon state that on the night of June 7th the Leon river rose and entered the eastern part of the city. Two persons were drowned, the Central railway track was washed out and the growing crops west of Leon were destroyed. The loss to property was small.

On the following night a tremendous water-spout broke a few miles above the town of Pason de Cuarenta, situated twenty miles from Lagos City. The flood was great and sudden, and practically annihilated Cuarenta. Thus far one hundred and seventy bodies have been recovered. Many bodies were washed several miles down the valley and are being discovered in the fields below the town. The search is now going on. Pason de Cuarenta had about eight hundred inhabitants before the flood.

Wilmington, North Carolina: the heavy rainfall during the night of the 9–10th flooded many basements and cellars in this city. The overflowing of a creek about one mile from the city caused a large washout on the New Berne road.

Fort Shaw, Montana: on the 13th Sun river rose rapidly; it continued to rise on the 14th, and on that date the town of Sun River, a few miles east of Fort Shaw, was flooded. Owing to the overflowed condition of the surrounding country travel was much impeded. On the 16th the first stage from Helena since the 12th arrived, and the driver reported that the roads were badly flooded and that many bridges had been washed away.

Keokuk, Iowa: from 2.10 to 3.10 p. m. on the 13th, more than two inches of rain fell. This was followed by a rise of ten feet in the Des Moines river. The town of Alexandria, Missouri, was flooded; also, an area of lowland about six miles in length by three miles in width.

Macon City, Macon county, Missouri: reports from the southern part of this county state that the heavy rainfall on the 19th resulted in the overflow of a large area of low lands, and at Bevier about two hundred feet of the Hannibal and Saint Joe railroad track were washed out.

Carlinville, Macoupin county, Illinois: the very heavy rains during the night of the 19–20th resulted in flooding the lowlands in this vicinity.

Saint Louis, Missouri, 21st: the very heavy rainfall of the night of the 19–20th caused a large amount of damage to growing crops, farm-houses and railroad embankments throughout "American Bottom," in Saint Clair and Madison counties, Illinois. Many villages were inundated and live stock in large numbers were drowned. At Collinsville, Madison county, and in that vicinity, a considerable territory was inundated and a number of dwellings and business houses were submerged to a more or less extent. At Belleville, Saint Clair county, the overflow of Richland creek caused a large amount of damage. More than one hundred families living along the creek had their dwellings flooded, and in some instances persons narrowly escaped drowning.

Pinckneyville, Perry county, Illinois: the heaviest fall of rain known for many years occurred during the early morning of the 20th, causing great damage to the growing crops; bridges and fencing throughout the county were washed away and considerable live stock drowned.

Jefferson City, Missouri: portions of the Callaway bottoms, opposite this city, were inundated on the 20th.

Duquoin, Perry county, Illinois: during the early morning of the 20th a remarkably heavy fall of rain occurred at this place, causing great damage to bridges and other property; the first floors of several dwellings were submerged.

Erie, Pennsylvania: the heavy rainfall (3.61 inches) which accompanied the storm during the night of the 21–22d, caused great damage by flooding cellars and washing out the sidewalks and streets. At the water-works an extensive landslide occurred, which damaged the machinery to the extent of \$2,000. The streams in the surrounding country overflowed and great damage was done to the crops.

Buffalo, New York: during the night of the 21–22d 3.28 inches of rain fell in five hours and thirty-five minutes. A large part of the northern section of the city was flooded and many families were compelled to leave their homes.

Chattanooga, Tennessee: a very heavy rainfall occurred between 2 and 5.15 a. m. on the 25th, about two inches having fallen in two hours and thirty minutes. The streets and sewers in this city were flooded and the roadways in the vicinity were badly washed.

Milwaukee, Wisconsin: a very heavy rainfall occurred from 7.30 to 8.45 p. m. on the 26th; a large number of washouts are reported from points along the railroads entering the city; considerable damage was done in this city by the flooding of cellars, etc.

Canaoharie, Montgomery county, New York: the very heavy rainfall on the afternoon of the 28th caused considerable damage in this vicinity by washing away fencing, etc. At Sharon Springs, Schoharie county, the hop yards and fields of corn and wheat were entirely ruined.

Lyons, Wayne county, New York: the rainfall during the evening of the 28th is considered the heaviest that has occurred here for many years. In a few minutes the streets in the village were flooded and all streams in the vicinity overflowed.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for June, 1885, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 87.69 per cent. The percentages for the four elements are: Weather, 88.06; direction of the wind, 88.51; temperature, 85.39; barometer, 90.98 per cent. By geographical districts, they are: For New England, 83.75; middle Atlantic states, 90.90; south Atlantic states, 85.81; eastern Gulf states, 88.22; western Gulf states, 87.59; lower lake region, 87.70; upper lake region, 85.83; Ohio valley and Tennessee, 87.00; upper Mississippi valley, 87.26; Missouri valley, 88.78; north Pacific coast region, 85.27; middle Pacific coast region, 89.29; south Pacific coast region, 94.35. There were two omissions to predict out of 3,567, or 0.06 per cent. Of the 3,565 predictions that have been made, sixty-three, or 1.77 per cent., are considered to have entirely failed; sixty-seven, or 1.88 per cent., were one-fourth verified; three hundred and fifty-three, or 9.90 per cent., were one-half verified; five hundred and ninety-six or 16.72 per cent., were three-fourths verified; 2,486, or 69.73 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

CAUTIONARY SIGNALS.

During June, 1885, one hundred and thirty-five cautionary signals were ordered. Of these, one hundred and nineteen, or 88.15 per cent., were justified by winds of twenty-five miles or more per hour, at or within one hundred miles of the station. Sixty-two cautionary off-shore signals were ordered, of which number, forty-four, or 70.97 per cent., were fully justified both as to direction and velocity; forty-eight, or 77.42 per cent., were justified as to direction; and fifty-two, or 83.87 per cent., were justified as to velocity. One hundred and ninety-seven signals of all kinds were ordered, one hundred and sixty-three, or 82.74 per cent., being fully justified. These do not include signals ordered at display stations where the velocity of the wind is only estimated. Of the above cautionary off-shore signals, twenty-six were changed from cautionary. Five signals were ordered late. In fifty-nine cases winds of twenty-five miles or more per hour were reported for which no signals were ordered.